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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,552	11/19/2003	Jinlian Hu	007198-556	5057

21839 7590 01/24/2008
BUCHANAN, INGERSOLL & ROONEY PC
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER

SERGEANT, RABON A

ART UNIT	PAPER NUMBER
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1796

NOTIFICATION DATE	DELIVERY MODE
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01/24/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/715,552	HU ET AL.	
	Examiner	Art Unit	
	Rabon Sergeant	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2007 and 25 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 7-12 and 16-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-12, and 16-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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1. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The subject matter of claim 9 fails to further limit claim 1 when the chain extender species lacks a carboxylic acid group. Within claim 9, only 2,2-dimethylolpropionic acid contains a carboxylic acid group.

2. Claims 1-3, 7-12, 16-20, and 23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicants have failed to provide support for the amendment within claim 1 specifying that the content of the solvent is with respect to the overall solid content. The examiner has reviewed the specification and finds no specific disclosure to support this amendment.

3. Claims 19-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicants have failed to provide adequate enablement for the production of polyurethanes having the properties set forth within claims 19-22. Consonant with the requirements set forth within *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir.

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1988) (MPEP 2164.01), the relevant undue experimentation factors have been analyzed as follows:

The Breadth of the Claims

Applicants' claims have been considered, and they are drawn to a polyurethane having a specific ratio of tensile strength and a glass transition temperature range of about -30°C to about 80°C; however, the claims fail to recite definitive compositional requirements (other than diisocyanate species for claims 19 and 20) that must be adhered to in order to obtain polyurethanes having the claimed properties.

The Nature of the Invention

The invention is drawn to the production of aqueous polyurethane dispersions and shape memory polyurethanes having a specific ratio of tensile strength and a glass transition temperature range of about -30°C to about 80°C.

The State of the Prior Art

Within the art, the production of aqueous polyurethane dispersions is well known; however, the production of aqueous dispersions having applicants' claimed ratio of tensile strength and the claimed glass transition temperature range is not explicitly disclosed. Furthermore, while shape memory polyurethanes were well known at the time of invention, such polymers do not appear to have been specifically disclosed or defined in terms of applicants' claimed characteristics. Accordingly, while the position is taken that prior art compositions relied upon within the prior art rejections inherently possess the claimed properties, the position is taken that the prior art fails to teach exactly how to produce polyurethanes in terms of the explicitly recited properties.

The Level of One of Ordinary Skill

While the skilled artisan is well aware of the steps necessary to produce an aqueous polyurethane dispersion and is well aware of the requirements for producing a shape memory polymer, it is not seen that the skilled artisan would necessarily possess any insight pertaining to the production of polyurethanes explicitly having the specific properties as claimed.

The Amount of Direction Provided by the Inventor

Aside from simply disclosing polyurethanes possessing the claimed properties, applicants' specification provides no clear teachings with respect to the ratio of reactants, the selection of appropriate reactants as they relate to one another, or other conditions that must be adhered to in order to obtain polyurethanes having the claimed properties. Applicants' discussion pertaining to polyurethanes possessing these properties is so vague that it is by no means clear that these polyurethanes can be produced from all of the reactants disclosed or from only some of them.

The Existence of Working Examples

Applicants set forth two examples of the invention, wherein each exemplified composition is derived from the same diol and includes the same diisocyanate. Furthermore, these limited examples are entirely silent with respect to the claimed properties at issue; therefore, it cannot be said that the working examples provide any insight into the production of polyurethanes that have the claimed properties. Even if it was shown that the exemplified compositions possess the claimed properties, the position is taken that the exemplified compositions are so limited that they would fail to provide any meaningful guidance in the production of other compositions having the claimed properties.

The Quantity of Experimentation Needed to Make or Use the Invention

Based on the Content of the Disclosure

Since the disclosure fails to specifically teach exactly how to obtain polyurethanes having the claimed properties and since the two limited exemplified compositions provide no indication that they even possess the properties, the position is taken that extensive experimentation would be required to make or use the invention as claimed.

Therefore, in view of the analysis of these factors, the position is taken that one of ordinary skill could not practice the invention as claimed without having to resort to undue experimentation.

In light of the analysis above, despite applicants' argument, the position is taken that it is clear that the description of the invention itself is insufficient to permit those skilled in the art to make and use the invention.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 7-12, and 16-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Ramanathan et al. ('213).

Patentees disclose the production of polyurethane aqueous dispersions, wherein a prepolymer is produced in the presence of solvent from diisocyanates, polyols and chain extenders that correspond to applicants' claimed components. After formation of the prepolymer, the acid groups resulting from incorporation of the chain extender are neutralized

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with an amine, such as triethylamine. The neutralized prepolymer is then dispersed in water and the solvent is removed. This disclosure satisfies applicants' steps d) through f). Furthermore, applicants' claimed ratios and reaction conditions are disclosed within the reference. See column 2, lines 45+ and columns 3-5. Patentees teach at column 5, lines 14-16 that the diisocyanate, polyol, and chain extender may be reacted sequentially to form block copolymers; therefore, patentees are considered to adequately disclose applicants' steps a) through c). Furthermore, since the disclosed polyurethanes are produced from reactants that meet those claimed, applicants' claimed physical properties are considered to be inherently possessed by the disclosed polyurethanes.

6. Applicants have argued that there is no disclosure of the addition of a chain extender after heating of the first mixture as presently claimed. In response and as aforementioned, patentees teach at column 5, lines 14-16 that the diisocyanate, polyol, and chain extender may be reacted sequentially to form block copolymers; therefore, patentees are considered to adequately disclose applicants' steps a) through c). Since sequential reaction is disclosed, the position is taken that conditions, such as heating, that promote reaction are encompassed by the disclosure. Despite applicants' remarks, applicants have provided no probative evidence to demonstrate a patentable distinction between the products of the prior art and the instant product. Furthermore, despite applicants' remarks, the position is maintained that it is reasonable to conclude that the prior art composition possesses the claimed properties given that the respective compositions are derived from reactants that fully meet those claimed. Contrary to applicants' assertions, the examiner has provided logical rationale as to why it is believed that the prior art meets the claims. Applicants have not established by any means that the products of the prior art do not possess the argued

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properties. Applicants' argument that the materials employed to form the instant invention differ from those employed in Ramanathan et al. is simply incorrect in view of the scope of applicants' claims.

7. Claims 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Klauck et al. ('433).

Patentees disclose the production of polyurethane aqueous dispersions, wherein a solventless prepolymer is produced from diisocyanates, polyols and chain extenders that correspond to applicants' claimed components. After formation of the prepolymer, the acid groups resulting from incorporation of the chain extender are neutralized with an amine. The neutralized prepolymer is then dispersed in water. See abstract and columns 3-10. Furthermore, since the disclosed polyurethanes are produced from reactants that meet those of applicants, applicants' claimed physical properties are considered to be inherently possessed by the disclosed polyurethanes.

8. Again contrary to applicants' assertions, the examiner has provided logical rationale as to why it is believed that the prior art inherently meets the claims. Applicants have provided no probative evidence to demonstrate a patentable distinction between the products of the prior art and the instant product. Furthermore, applicants' remarks are not commensurate in scope with the claims, in that the rejected claims do not exclude the argued isocyanate species; neither claim 21 nor claim 22 is governed by any requirement specifying the presence or absence of any reactant. Furthermore, it is noted that applicants clearly disclose at page 3, line 8 of the specification that tetramethyl xylene diisocyanate is a suitable diisocyanate. Accordingly, it is reasonable to rely upon a reference that teaches its use in a situation where the claims do not


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exclude its use. Lastly, applicants' argument that the materials employed to form the instant invention differ from those employed in *Klauck et al.* is simply incorrect in view of the scope of applicants' claims.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication should be directed to Rabon Sergent at telephone number (571) 272-1079.


RABON SERGENT
PRIMARY EXAMINER

R. Sergent
January 17, 2008